Center Independent Research & Development: GSFC IRAD

OH Solar Radiometer

Completed Technology Project (2016 - 2018)

Project Introduction

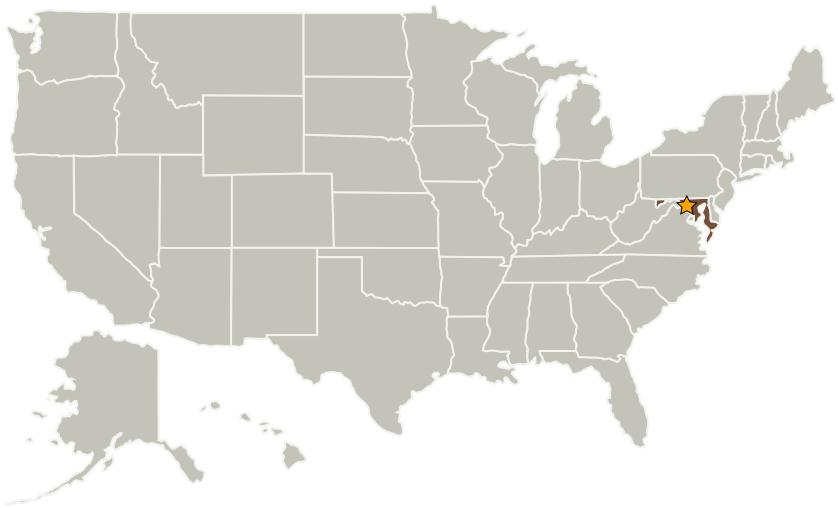
The abundance of the hydroxyl radical, OH, determines the lifetime of methane and its global warming potential. Despite the growing importance of methane and the need to quantify its removal rate from the atmosphere, there is currently no technique that can measure the column of OH from space. We propose to design, build and demonstrate the capability to measure the OH column using a new OH solar radiometer.

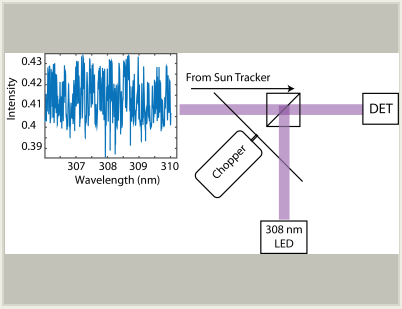
Our objective is to demonstrate the capability to detect the column of OH with solar absorption. The project will design and test an OH detector using an existing sun tracker.

Anticipated Benefits

Reaction with OH is the primary sink of atmospheric methane. Because of the growing importance of methane emissions, we have a growing need to better understand OH at the regional to global scale. Methane is removed by the reaction with OH, primarily below 200 hPa and primarily in the tropics via the reaction: CH_4 + OH -> CH_3 + H_2O. It is this removal process that determines the lifetime of methane in the atmosphere and its global warming potential (GWP). Methane is about 100 times more active as a greenhouse gas than CO_2. However, since methane has only a 10 year lifetime in the atmosphere due to *R1*, the GWP for a molecule of methane is only 28 - 36 times that of CO_2 over a 100 year period. Our ability to estimate the GWP of methane and its impact on the present and future climate depends critically on our ability to measure and predict OH.

Primary U.S. Work Locations and Key Partners





The OH radiometer uses the solar absorption at 308 nm to measurethecolumn abundance of OH.

Table of Contents

Center Independent Research & Development: GSFC IRAD

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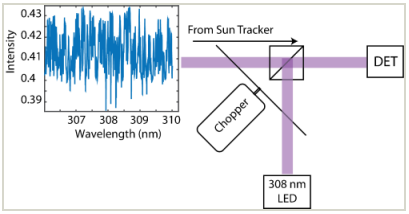
Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations
Maryland

Images



OH Radiometer
The OH radiometer uses the solar absorption at 308 nm to measurethecolumn abundance of OH.
(https://techport.nasa.gov/image/26332)

Project Website:

http://sciences.gsfc.nasa.gov/sed/

Organizational Responsibility

Responsible Mission Directorate:
Mission Support Directorate (MSD)

Lead Center / Facility:
Goddard Space Flight Center (GSFC)

Responsible Program:
Center Independent Research & Development: GSFC IRAD

Project Management

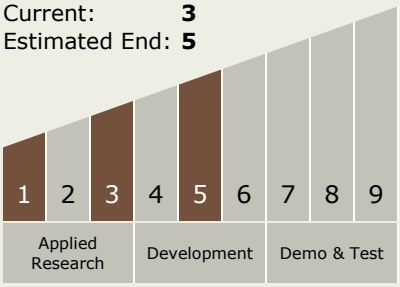
Program Manager:
Peter M Hughes

Project Managers:
Matthew J Mcgill
William E Cutlip

Co-Investigator:
Steven A Bailey

Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **5**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.3 Optical Components

Target Destination

Earth